



FEB 12 2016

L-PI-16-011  
10 CFR 50.73

ATTN: Document Control Desk  
U S Nuclear Regulatory Commission  
Washington, DC 20555-0001

Prairie Island Nuclear Generating Plant Unit 2  
Docket: 50-306  
Renewed License No. DPR-60

LER 50-306-2016-001-00, Unit 2 Reactor Trip due to a Ground Fault resulting in a Generator Trip

Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter "NSPM"), encloses Licensee Event Report (LER) 50-306/2016-001-00, Unit 2 Reactor Trip due to a Ground Fault resulting in a Generator Trip.

Summary of Commitments

This letter contains no new commitment and no change to an existing commitment.

A handwritten signature in black ink that reads 'Kevin Davison'.

Kevin Davison  
Site Vice President, Prairie Island Nuclear Generating Plant  
Northern States Power Company - Minnesota

Enclosure

cc: Administrator, Region III, USNRC  
Project Manager, Prairie Island Nuclear Generating Plant (PINGP), USNRC  
Resident Inspector, PINGP, USNRC  
Department of Commerce, State of Minnesota

**ENCLOSURE**

**LICENSEE EVENT REPORT 50-306/2016-001-00**

4 Pages Follow

<b>NRC FORM 366</b> (11-2015)	<b>U.S. NUCLEAR REGULATORY COMMISSION</b>    <b>LICENSEE EVENT REPORT (LER)</b>	<b>APPROVED BY OMB: NO. 3150-0104</b>  Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.	<b>EXPIRES: 10/31/2018</b>
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<b>1. FACILITY NAME</b> Prairie Island Nuclear Generating Plant	<b>2. DOCKET NUMBER</b> 05000306	<b>3. PAGE</b> 1 OF 4
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<b>4. TITLE</b>										
Unit 2 Reactor Trip due to a Ground Fault resulting in a Generator Trip										
<b>5. EVENT DATE</b>			<b>6. LER NUMBER</b>			<b>7. REPORT DATE</b>			<b>8. OTHER FACILITIES INVOLVED</b>	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	17	2015	2016	- 001	- 00	02	12	2016	FACILITY NAME	DOCKET NUMBER
										05000
										05000

<b>9. OPERATING MODE</b>		<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>							
1	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)					
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)					
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)					
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)					
100	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)					
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)					
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)					
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(i)					
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)					
		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> OTHER	Specify in Abstract below or in NRC Form 366A					

<b>12. LICENSEE CONTACT FOR THIS LER</b>									
<b>LICENSEE CONTACT</b> Penny S. Oleson								<b>TELEPHONE NUMBER (Include Area Code)</b> 651-267-1750	


<b>13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT</b>									
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

<b>14. SUPPLEMENTAL REPORT EXPECTED</b>					<b>15. EXPECTED SUBMISSION DATE</b>		
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE)					<input checked="" type="checkbox"/> NO		
					MONTH	DAY	YEAR

**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)**

On 12/17/2015 at 1234 Central Standard Time (CST) with Unit 2 (U2) in Mode 1 at 100 percent power, the U2 electric generator tripped due to a ground overvoltage protection relay (59/2G) actuation, which resulted in an automatic reactor trip and expected Auxiliary Feedwater System actuation. At 1307 CST a fire alarm was received in the U2 containment. Personnel were unable to verify the status within 15 minutes and the site declared an Unusual Event, HU2.1, at 1318 CST. The licensee notified the NRC Resident Inspector, state and local authorities and made an Event Notification to the NRC for the Unusual Event and the U2 reactor trip as required under 10 CFR 50.72(a)(1)(i) and 10 CFR 50.72(b)(2)(iv)(B). Subsequently, the Unusual Event was terminated on 12/17/2015 at 1450 CST after a containment entry determined there was no smoke or fire. The original Event Notification was updated to cancel the Unusual Event and to add reporting under 10 CFR 50.72(b)(3)(iv)(A) for the expected Auxiliary Feedwater system actuation. Decay heat removal was via forced circulation with Auxiliary Feed and Steam Dumps providing secondary cooling. Offsite power remained available. The health and safety of the public was not at risk.

A troubleshooting plan was initiated which determined an actual ground fault existed internal to the new U2 electric generator, installed during the Fall 2015 U2 refueling outage, causing a U2 reactor trip and the expected Auxiliary Feedwater actuation. The cause of the ground fault of the U2 electric generator was determined to be foreign material, specifically a hex socket and hex key introduced at the vendor's manufacturing facility during installation of a temporary dust cover on collector end of the generator rotor.

<b>NRC FORM 366A</b> <b>U.S. NUCLEAR REGULATORY COMMISSION</b> (11-2015)  <b>LICENSEE EVENT REPORT (LER)</b> <b>CONTINUATION SHEET</b>		<b>APPROVED BY OMB: NO. 3150-0104</b> <b>EXPIRES: 10/31/2018</b> Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.		
<b>1. FACILITY NAME</b>	<b>2. DOCKET NUMBER</b>	<b>3. LER NUMBER</b>		
Prairie Island	05000306	YEAR	SEQUENTIAL NUMBER	REV NO.
		<b>2016</b>	<b>- 001</b>	<b>- 00</b>

### Event Description


The Prairie Island Nuclear Generating Plant (PINGP) Unit 1 (U1) and Unit 2 (U2) electric generators were supplied by a vendor through a contract awarded on 12/28/2012 with Xcel Energy. The electric generators were fabricated and assembled by a subcontractor at the vendor manufacturing site between April 2013 and June 2015. The electric generators were shipped to PINGP in 2015 fully assembled with the rotor installed in the stator. The U2 electric generator was installed by the vendor during the fall 2015 U2 refueling outage. The U2 electric generator was successfully tested and synchronized to the grid on 12/13/15. The U1 replacement electric generator remains staged at the PINGP site awaiting installation.

On 12/17/2015 U2 was in Mode 1 running at 100% power. At 1234 CST, the U2 electric generator tripped due to a ground overvoltage protection relay (59/2G) actuation, which resulted in an automatic reactor trip and expected Auxiliary Feedwater System<sup>1</sup> actuation. At 1307 CST a fire alarm was received in the U2 Containment. Personnel were unable to make a containment entry to verify the status of the alarm within 15 minutes, and the site declared an Unusual Event, HU2.1 at 1318 CST.

The licensee notified the NRC Resident Inspector, state and local authorities and made an Event Notification to the NRC for the Unusual Event and the U2 reactor trip as required under 10 CFR 50.72(a)(1)(i) and 10 CFR 50.72(b)(2)(iv)(B). The Unusual Event was terminated on 12/17/2015 at 1450 CST after a containment entry determined there was no smoke or fire. The site updated the Event Notification cancelling the Unusual Event and reporting, under 10 CFR 50.72(b)(3)(iv)(A), the Auxiliary Feedwater System actuated to start the Auxiliary Feedwater pumps, as designed, to provide makeup flow to the steam generators.

Decay heat removal was via forced circulation with reactor coolant pumps and auxiliary feed and steam dumps providing secondary cooling. Offsite power remained available. The health and safety of the public were not at risk.

<sup>1</sup> EIIIS System Code – BA

<b>NRC FORM 366A</b> <b>U.S. NUCLEAR REGULATORY COMMISSION</b>  (11-2015)  <div style="text-align: center;">   <b>LICENSEE EVENT REPORT (LER)</b>   <b>CONTINUATION SHEET</b> </div>		<b>APPROVED BY OMB: NO. 3150-0104</b> <b>EXPIRES: 10/31/2018</b>  Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.		
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Event Analysis

The electric generators are expected to operate continuously during normal plant operations. As a result of the U2 electric generator trip, the plant entered an extended forced outage. Until repaired and returned to service, the U2 electric generator is not capable of producing reliable electric power as expected.

A troubleshooting team of PINGP and vendor personnel were put in place to determine the cause of the U2 electric generator trip and apply lessons learned prior to installing the new U1 electric generator currently stored at PINGP awaiting installation in a future outage. The team verified the relay actuation was due to an actual ground fault condition isolated to number 25 Top Stator Coil. Initial visual inspection of the U2 electric generator after the trip did not reveal a cause of the trip. Investigation under warranty work by the vendor indicated foreign material caused wear to the insulation of the stator winding which eventually failed, actuated the relay, and tripped the U2 electric generator. The damage was created by foreign material (FM); specifically, a 10-mm socket and hex key.

The vendor conducted a root cause evaluation and states the FM was introduced at the vendor's manufacturing facility. The activity that introduced the FM in the U2 electric generator was part of an assembly sequence that was not used on the U1 electric generator.

Safety Significance

This event did not represent a significant challenge to nuclear safety and all plant systems responded as designed. The automatic reactor trip occurred as designed because of the turbine trip. Offsite power remained available. There was no radiological, environmental, or industrial impact associated with this event. The health and safety of the public and site personnel were not at risk at any time during this event.

(11-2015)



**LICENSEE EVENT REPORT (LER)**  
**CONTINUATION SHEET**

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Cause

- Foreign material at the vendor manufacturing facility caused damage to the number 25 Top Stator Coil of the U2 electric generator leading to a ground fault.

Corrective Actions

- Foreign material was removed from the U2 electric generator.
- An extensive search of the U2 electric generator was performed and no other foreign material was identified.
- Replaced the number 25 Top Stator Coil of the U2 electric generator.

Previous Similar Events

There was no event within the last 5 years with the same failure and same root or apparent cause.